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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,470	11/10/2003	Robert L. Fair	112056-0123	5732

24267 7590 01/16/2008		EXAMINER	
CESARI AND MCKENNA, LLP		WALTER, CRAIG E	
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BOSTON, MA 02210	ART UNIT	PAPER NUMBER	
	2188		

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

MN

Office Action Summary	Application No.	Applicant(s)
	10/705,470	FAIR ET AL.
	Examiner	Art Unit	
	Craig E. Walter	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A. SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 November 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11, 13-26 and 28-48* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11, 13-26 and 28-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

DETAILED ACTION

Status of Claims

1.   Claims 1-11, 13-26 and 28-48 are pending in the Application.

Claims 1, 6-11, 13, 14, 20-22 and 28-31 are amended.

Claims 38-48 are new

Claims 12 and 27 are cancelled.

Claims 1-11, 13-26 and 28-48 are rejected.

Response to Amendment

2.   Applicant's amendments and arguments filed on 7 November 2007 in response

to the office action mailed on 7 August 2007 have been considered but they are not

persuasive. Therefore the rejections are maintained below, with changes as necessary

to address any amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 11 and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hitz et al. (US Patent 5,819,292), hereinafter Hitz, in view of Ganesh et al. (US

Patent 6,192,377 B1), hereinafter Ganesh.

As for claim 11, Hitz teaches a method for detecting leaked buffer writes between

a first consistency point and a second consistency point, comprising:

selecting a data buffer (a buffer is selected to store the inode which

contains the meta-data file – col. 9, lines 19-49. The meta-data file comprises,

inter alia, a block map – col. 5, lines 48-59. Hitz further describes the block map

as consisting of information for up to 20 snapshots. Since the consistency points

are classified as points after a snapshot, the block map comprises the

information needed to ascertain the consistency point number – col. 4, lines 6-

43);

determining if the selected data buffer includes a buffer check control

structure (the system inherently makes a determination if the buffer check control

structure within an inode is present simply by referring to the data recorded within

it);

determining, in response to the selected data buffer including a buffer

check control structure, if a consistency point number within the buffer check

control structure is correct, and if so, performing a write operation of the file

system buffer (before converting to a new consistency point, the system will

perform a check sum on the fsinfo structure (containing the root inode which

comprises the consistency point information) to determine if the one of the copies

has been corrupted in some way. Once consistency is determined, the system will continue to write the new node to the disk – col.12, lines 11-48).

Though the Hitz discloses storing consistency point numbers in the buffer check control structure, he fails to further teach determining if one or more uniquely identifying numbers (hereinafter magic numbers) are within the data buffer check control structure as recited in the instant claim.

Ganesh however teaches an apparatus for determining whether a transaction can use a version of a data item, in which he describes entries in data blocks as containing an index number (i.e. magic number). Also note that Ganesh additionally teaches a consistency point number (i.e. snapshot number), which is used conjunction with the indices to detect differences in versioned snapshots – col. 4, lines 33-41.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hitz to further include Ganesh's apparatus for determining whether a transaction can use a version of a data. By doing so, he would have a means of more quickly and reliably examining and determining which particular version of updated data blocks to use in a requested transaction, which in turn would require fewer system resources, making his system overall more efficient, as presently taught by Ganesh in col. 4, lines 42-64.

As for claims 13 and 14, Hitz fails to teach magic numbers as recited in this claim. Ganesh however teaches magic numbers (see col. 4, lines 33-41), and even though he does not explicitly teach the magic number as comprising either a 64-bit number, two 32-bit number, nor the consistency point number as comprising a 32-bit

number, such limitations are merely a matter of design choice and would have been obvious in the system of Ganesh. These limitations fail to define a patentably distinct invention over Ganesh since both the invention as a whole and that of Ganesh's are directed to storing a magic number used to uniquely identify the data block; and storing a consistency number, used to track certain points in time the system maintained a consistent state.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hitz to further include Ganesh's apparatus for determining whether a transaction can use a version of a data. By doing so, he would have a means of more quickly and reliably examining and determining which particular version of updated data blocks to use in a requested transaction, which in turn would require fewer system resources, making his system overall more efficient, as presently taught by Ganesh in col. 4, lines 42-64.

As for claim 15, Hitz teaches the method of claim 11 wherein the step of determining if the consistency point number is correct further comprises the step of determining if the consistency point number within the buffer check control structure equals a consistency point number identifying a current consistency point (col. 11, line 62 through col. 12, line 38 – the system maintains two identical copies of the root inode containing the information of the consistency point of the system. The system can then compare the current root inode with the copy to determine if the consistency point is accurate, and that no failure has occurred).

As for claim 16, Hitz teaches the method of claim 11 wherein the step of performing a write operation further comprises a step of writing a set of raw data within the data buffer to disk (all data written is written to the disk – see abstract. The data is buffered before flushed and written to the disk).

As for claim 17, Hitz teaches the method of claim 16 wherein the raw data comprises the buffer check control structure (both the buffer data structure (1010B), and the pointers (1010C) are stored and associated with the inode, hence comprise the raw data buffer associated with the data buffer – col. 7, lines 5-41).

As for claim 18, Hitz teaches the method of claim 16 wherein the step of performing the write operation further comprises a step of removing the buffer check control structure from the data before writing the file system buffer to disk (the buffered data is flushed (i.e. removed) from the buffer before it is written to the newly allocated regions on the disk - col. 12, lines 9-24).

As for claim 19, Hitz teaches the method of claim 16 wherein the step of performing the write operation comprises the step of writing only the raw data within the file system buffer to disk (col. 12, lines 9-24 – the raw data is the only data flushed to the disk during the update). :

4.   Claims 1-10, 20-26 and 28-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hitz (US Patent 5,819,292), in view Marion et al. (US PG Publication 2003/0163661 A1), hereinafter Marion, and in further view of Ganesh (US Patent 6,192,377 B1).

As for claims 1, 20 and 22, Hitz teaches method for detecting leaked buffer writes between a first consistency point and a second consistency point, the method comprising:

receiving a write operation, the write operation identifying a file for the write operation (Hitz's invention is directed to managing changes to a file system. In his disclosure, Hitz describes a Write Anywhere File-System Layout (WAFL) directed to writing new data (i.e. files) to the file system (i.e. storage system of claim 22). The files can write new inode files to the file system – col. 4, lines 6-32);

creating a data buffer associated with the write operation (referring to Fig. 10, when a new incore inode is created (1010A), an area is allocated to the inode in order to store information, a WAFL buffer structure (1010B), a set of pointers (1010C), and an on-disk inode (1010D). The pointers point to the newly created indirect WAFL buffers (1020) – col. 7, lines 5-41). Note the area needed to store these elements is created (i.e. allocated) as Hitz explicitly describes his invention as writing new data to unallocated blocks on a disk – see abstract; and

Though Hitz teaches writing a buffer check control structure to a raw data buffer associated with the data buffer (again both the buffer data structure (1010B), and the pointers (1010C) are stored and associated with the inode, hence comprise the raw data buffer associated with the data buffer – col. 7, lines 5-41), he fails to do so in response to determining the volume has buffer leakage detection activated as recited in these claims.

Marion however teaches a system and method for tracking memory leaks which checks a memory leak flag to track memory allocation and de-allocation activities (paragraphs 0010, and 0011, all lines). More specifically, (referring to Fig. 3, elements 310, 320 and 330 and paragraph 0046-0048, all lines), a determination is made to track memory leaks or not (leak detection activation). Based on this determination, the remaining memory allocation executes. Note by combining the teachings of Hitz and Marion, they would be able to check for memory leaks prior to allocating new files, and subsequently prior to writing the buffer control check structure to the raw buffer (i.e. in response to the determination).

Though the combined teachings of Hitz and Marion disclose storing consistency point numbers in the buffer check control structure, they fail to further teach storing one or more magic numbers.

Ganesh however teaches an apparatus for determining whether a transaction can use a version of a data item, in which he describes entries in data blocks as containing an index number (i.e. magic number). Also note that Ganesh additionally teaches a consistency point number (i.e. snapshot number), which is used conjunction with the indices to detect differences in versioned snapshots – col. 4, lines 33-41.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hitz to further include Marion's method of tracking memory leaks into his own system for maintaining consistency states of a file system during file allocation. By doing so, Hitz could benefit by having an efficient means of memory leak detection,

which in turn could help improve system performance as taught by Marion, paragraphs 0007-009, all lines.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hitz to further include Ganesh's apparatus for determining whether a transaction can use a version of a data. By doing so, he would have a means of more quickly and reliably examining and determining which particular version of updated data blocks to use in a requested transaction, which in turn would require fewer system resources, making his system overall more efficient, as presently taught by Ganesh in col. 4, lines 42-64.

As for claim 6, though the combined teachings of Hitz and Marion disclose storing consistency point numbers in the buffer check control structure, they fail to further teach storing one or more magic numbers in which the magic numbers uniquely identify a particular buffer check control structure.

Ganesh however teaches an apparatus for determining whether a transaction can use a version of a data item, in which he describes entries in data blocks as containing an index number (i.e. magic number). Also note that Ganesh additionally teaches a consistency point number (i.e. snapshot number), which is used conjunction with the indices to detect differences in versioned snapshots – col. 4, lines 33-41.

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hitz to further include Ganesh's apparatus for determining whether a transaction can use a version of a data. By doing so, he would have a means of more quickly and reliably examining and determining which particular version of updated data

blocks to use in a requested transaction, which in turn would require fewer system resources, making his system overall more efficient, as presently taught by Ganesh in col. 4, lines 42-64.

As for claim 21, though the combined teachings of Hitz, Marion and Ganesh disclose all the limitations of the claim (as per the rejection of claims 1, *supra*), they fail to specifically teach said method as being implemented on a computer readable media with instructions executed by a processor as recited in this claim.

Examiner takes Official Notice (see MPEP § 2144.03) that implementing a method to be performed on a file system (as described by Hitz) via the use of a "computer readable media containing instructions for execution on a processor" in a computing environment was well known in the art at the time the invention was made.

One of ordinary skill in the art would have been motivated to implement the method as instructions on a computer readable media, as it is well known in the art that such implementation is inexpensive, and easy to maintain.

Since Applicant failed to traverse the examiner's previous assertion of Official Notice, the use of a "computer readable media containing instructions for execution on a processor" is taken to be admitted prior art pursuant to MPEP § 2144.03, subsection C.

As for claims 7, 8 and 10, though neither Hitz nor Marion teach magic numbers, Ganesh does in fact teach magic numbers (as per claim 1 above), even though he does not explicitly teach the magic number as comprising either a 64-bit numbers, two 32-bit numbers, nor the consistency point number as comprising a 32-bit number. Such limitations however are merely a matter of design choice and would have been obvious

in the system of Ganesh. These limitations fail to define a patentably distinct invention over Ganesh since both the invention as a whole and that of Ganesh's are directed to storing a magic number used to uniquely identify the data block; and storing a consistency number, used to track certain points in time the system maintained a consistent state.

As for claims 2 and 23, Hitz teaches creating the data buffer as further comprising the step of creating a buffer control structure and a raw data buffer (the structures previously described in the rejection of claim 1 illustrate the buffer control structure and raw data buffer which are created when the incore inode is created (i.e. allocated)).

As for claims 3 and 24, Hitz teaches the buffer control structure as comprising a pointer to the raw data buffer (the buffer structure contains pointers to reference the 16 buffer pointers (1010C) - col. 7, lines 5-16).

As for claim 4, Hitz teaches the method of claim 1 wherein the step of writing the buffer check control structure to the raw data buffer further comprises the steps of:

creating the buffer check control structure (again, the buffer check control structure is created upon allocation of the inode); and

overwriting a portion of the raw data buffer with the buffer check control structure (a portion of the raw data buffer is comprised of the buffer structure (1010B)).

As for claims 5 and 26, Hitz teaches the step of writing the buffer check control structure to the raw data buffer as further comprising the steps of:

creating the buffer check control structure (again, the buffer check control

structure is created upon allocation of the inode); and

associating the buffer check control structure to the raw data buffer in a

contiguous block of memory (the buffer check is associated with the raw data

buffer as it contains pointers that reference a block within the buffer itself – col. 7,

lines 5-41. Note by definition a block of data is contiguous; therefore the

information is inherently stored contiguously. Additionally, Fig. 10 depicts the

information as being stored contiguously in blocks).

As for claim 9, Hitz teaches his consistency point number as identifying a current

consistency point (again, the most recently recorded consistency point is indicative of

the system's most current point of consistency).

As for claim 25, Hitz teaches overwriting the buffer (col. 23, lines 45-67 – see

also Figs. 23A and 23B).

Claim 38 is similar in scope to claims 1 and 22, therefore it is rejected based on

the same rationale as those claims discussed *supra*.

Claim 48 is similar in scope to claim 38; therefore it is rejected based on the

same rationale as claim 38 *supra*.

Claim 32 is rejected based on the same rationale as claim 6 as discussed above.

Claims 28-31 are rejected based on the same rationale as claims 7-10

respectively.

Claims 33, 34, 35, 36 and 37 contain similar limitations as claims 1, 9, 2, 4 and 5

respectively; therefore they are rejected based on the same rationale as these claims.

Claims 39-47 contain similar limitations as claims 2-10 respectively; therefore

they are rejected based on the same rationale as these claims.

Response to Arguments

5.   Under the heading "Claims Rejections – 35 USC § 102(b)", Applicant puts forth a

generic argument asserting that Hitz fails to teach key features of the claimed invention,

however fails to set forth any specific arguments (see pages 16-17 of Remarks). These

generic arguments do not point out any specific distinctions between Hitz and the

claimed invention – therefore they are not persuasive.

Continuing under this heading (page 18 of Applicant's remarks), Applicant

asserts, "[i]n contrast, there is no disclosure in Hitz which determines if one or more

magic values are contained within the data buffer. Hitz discloses a method for creating

read- only copies of a file system (i.e., snapshots) and at no time does Hitz determine

whether or not uniquely identified magic numbers are used to identify his snapshots."

This argument however is rendered moot as Examiner maintains that claims 1,

11, 20-22 and 32 are rejected under § 103(a) as per the rejections discussed *supra*.

Applicant concludes on page 18 under this heading by again putting forth a

generic argument asserting that Hitz fails to teach key features of the claimed invention.

Again, this generic statement lacks specific arguments contrasting the prior art with the

instant claims – therefore this "argument" is not persuasive.

Under the heading "Claims Rejections – 35 USC § 103", Applicant puts forth a

generic argument asserting that Hitz, Marion, nor Ganesh disclose teach key features of

the claimed invention, however fails to set forth any specific arguments (see page 20 of Remarks). These generic arguments do not point out any specific distinctions between the prior art and the claimed invention; therefore they are not persuasive.

Continuing under this heading (pages 21-22 of Remarks), Applicant contends, "Ganesh does not disclose determining whether at least two magic numbers and one consistency number are present in the buffer control structure in order to determine whether or not the there is a leak in the buffer write operations. Rather, Ganesh merely discloses using an index to locate various versions of a block to see if those versions may be overwritten for that particular transaction. Unlike the Applicant' s claimed invention, Ganesh does not determine if a specific magic number is located within the buffer check control structure in order to determine where the pointers are correctly labeled. Neither Hitz nor Marion, disclose the uses of uniquely identifying numbers (i.e., magic numbers) that may be used to detect buffer leakage in the storage system."

This argument however is not persuasive because it is not commensurate with the scope of the claims. Since Applicant fails to provide Examiner with a specific claim number in which to contrast the prior art reference with, Examiner will evidence his assertion that this argument is not commensurate by comparing it to the positively recited elements of claim 1. Claim 1 requires, *inter alia*, "the buffer control structure including one or more uniquely identifying numbers referred to as magic number and a consistency point number". As per the arguments presented *supra*, Ganesh clearly discloses indices (i.e. magic numbers, which are defined by Applicant to be "uniquely

identifying numbers – col. 4, lines 33-41. As such, Ganesh, in combination with the other cited art, teaches this limitation, Applicant's arguments notwithstanding.

Continuing under this heading (page 22 of Applicant's remarks), Applicant asserts, "[a]pplicant respectfully urges that Marion' s flag indicating whether or not his memory is allocated cannot *anticipate* Applicant's claimed method which performs determining if a consistency point number within the buffer check control structure is correct... in response to both the consistency point and the uniquely identifying numbers being correct" (emphasis added).

This argument however is not persuasive. Applicant is reminded, pursuant to MPEP § 2145 (IV.), "[o] ne cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)." The rejection Applicant is attacking is based on a combination of references within an obviousness rejection, hence Applicant's statements with regards to whether or not Marion anticipates the instant claims is rendered moot.

Applicant concludes on pages 22-23 under this heading by again putting forth a generic argument asserting that Hitz, Marion or Ganesh, either taken either singly or in any combination, fail to teach key features of the claimed invention. Again, this generic statement lacks specific arguments contrasting the prior art with the instant claims – therefore this "argument" is not persuasive.

Conclusion

6.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time
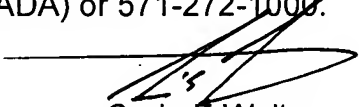
policy as set forth in 37 CFR 1.136(a).

7.   A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Craig E. Walter whose telephone number is (571) 272-

8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

9.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hyung S. Sough can be reached on (571) 272-6799. The fax phone

number for the organization where this application or proceeding is assigned is 571-
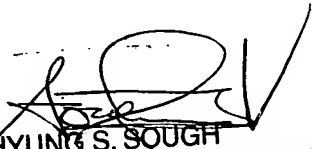
273-8300.

10.   Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Craig E Walter
Examiner
Art Unit 2188

CEW

HYUNG S. SOUGH
SUPERVISORY PATENT EXAMINER
01/11/08